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10/567,815	04/10/2006	Jae Yong Han	50413/012001	6292

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EXAMINER	
LONG, SCOTT	

ART UNIT	PAPER NUMBER
1633	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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patentadministrator@clarkelbing.com

Office Action Summary	Application No.	Applicant(s)	
	10/567,815	HAN ET AL.	
	Examiner	Art Unit	
	Scott D. Long	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 10-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 10-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The examiner acknowledges receipt of Applicant's Remarks and Claim amendments, filed on 30 May 2008.

Claim Status

Claims 1 and 13-15 are amended. Claims 8-9 are cancelled. Claims 1-7 and 10-15 are under current examination.

Priority

This application claims benefit as a 371 of PCT/KR04/02018 (filed 08/11/2004). This application also claims benefit from foreign application REPUBLIC OF KOREA 10-2003-0055326 (filed 11 August 2003). The instant application has been granted the benefit date, 11 August 2003, from foreign application REPUBLIC OF KOREA 10-2003-0055326.

Response to Arguments - Claim Rejections 35 USC § 112

Response to Arguments – 35 USC 112, second paragraph

The rejection of Claim 14 under 35 USC 112, second paragraph, is withdrawn in response to the applicant's arguments. Applicant's arguments (Remarks, page 5) filed 30 May 2008, with respect to claim 14 have been fully considered and are persuasive Therefore, the rejection of claim 14 under 35 USC 112, second paragraph is hereby withdrawn.

Response to Arguments - Claim Rejections 35 USC § 102

The rejection of Claims 1, 3-6, 10, 12 and 15 under 35 USC 102(b) as anticipated by Lin (US2002/0076797), is withdrawn in response to the applicant's arguments and claim amendments. However, claims 13 and 14 remain rejected under 35 USC 102(b) as anticipated by Lin (US2002/0076797) for the reasons of record and the comments below.

Applicant's arguments (Remarks, pages 6-7) filed 30 May 2008, with respect to claims 1, 3-6, 10, 12 and 15 have been fully considered and are persuasive. The applicant has argued that limitations from claims 8-9 have been incorporated into the base claims, namely "injecting said cultured spermatogonial cell population into the

most upper portion of the seminiferous tubule." Therefore, the rejection of claims 1, 3-6, 10, 12 and 15 under 35 USC 102(b) as anticipated by Lin is hereby withdrawn.

However, the applicant provides no arguments to traverse Lin's teaching of an avian germline chimera of claim 13. Furthermore, claim 14, being dependent from claim 13, but having limitations which require that the chimeric avian is produced by any one of the methods of claims 1-7, 10 and 11, is essentially a product-by-process claim. Therefore, a product produced by any method, which meets the structural limitations will satisfy the limitations of claim 14. Lin teaches “the primitive cells are also transfected with a piwi family gene to facilitate production of germ cells in the transgenic or chimeric bird and thereby also facilitate germline transmission of the DNA sequence of interest” (page 14, parag.0137). The examiner concludes from such a statement by Lin, that the limitations of claims 13 and 14 are met. Therefore, the examiner finds the applicant's argument unpersuasive.

Accordingly, the examiner hereby maintains the rejection of claims 13-14 under 35 USC 102(b) as anticipated by Lin.

Response to Arguments - Claim Rejections 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7 and 10-15 remain rejected under 35 USC 103(a) as being unpatentable over Lin (US2002/0076797, published 20 June 2002) in view of Rapp et al. (US2003/0126629, published 3 July 2003) and further in view of Li et al. (2002 Poultry Science; 81:1360-1364) for the reasons of record and the comments below.

The applicant argues that Rapp et al. fails to make up for the deficiency of Lin regarding the injection of transgenic spermatogonial cells into the upper most seminiferous tubule. The applicant suggests (Remarks, page 9) that the Rapp et al. *in vitro* method (germline cell injection method) does not disclose the technical feature of the currently amended claim 1, which requires "injection of spermatogonial cells or testicular cells into the most upper portion of seminiferous tubules of the recipient" (Remarks, page 9, lines 2-4, and page 8, lines 15-17). Contrary to the applicant's assertion, Rapp et al. teach these limitations. Rapp et al. teach an "in vitro, method of incorporating heterologous genetic material into the genome of an avian involves isolating male germ cells ex corpora, delivering a polynucleotide thereto and then returning the transfected cells to the testes of a recipient male bird." (page 15,

parag.0152). Rapp et al. teach "[t]he term 'male germ cells' as used herein refers to spermatozoa (i.e., male gametes) and developmental precursors thereof....which can be genetically modified, including the primitive spermatogonial stem cells" (parag.0063). Rapp et al. teach an *in vivo* embodiment which "employs injection of the gene delivery mixture, preferably into the seminiferous tubules, or into the pete testis, and most preferably into the vas efferens or vasa efferentia" (page 15, parag.0154) which encompasses the most upper portion of the seminiferous tubule. Although the Rapp et al. *in vivo* and *in vitro* methods of gene delivery have some differences, it is clear that germ cells are directed into the testes in both methods. The method of Rapp et al. referred to as "in vivo" specifically recites injection to seminiferous tubules. It is known in the art that the seminiferous tubules are located in the testes. Rapp et al. further teach that such *in vivo* gene delivery permits "genetically modified germ cell [to] differentiate in their own milieu" (page 15, parag.0154). The multistage process of sperm formation takes place in the lining of the seminiferous tubules, starting with spermatogonia or primitive sperm cells. Rapp et al. specifically indicates that modified germ cells can be transferred to the gonad of an avian and particularly indicate that "the basic rigid architecture of the gonad should not be destroyed, nor significantly damaged. Disruption of tubules may lead to impaired transport of testicular sperm and result in infertility. Sertoli cells should not be irreversibly damaged, as they provide a base for development of the germ cells during maturation, and for preventing the host immune defense system from destroying grafted foreign spermatogonia" (parag.0163). Since Rapp et al. is very explicit about not damaging the testes and also provides a method

for introducing materials into the testes (i.e., injection into seminiferous tubules), the examiner believes a skilled artisan would use the method of injection into seminiferous tubules described in the in vivo method of Rapp et al. when injecting the *in vitro* transduced spermatogonia into testes. Accordingly, the examiner finds the applicant's arguments unpersuasive.

In addition, the applicant argues that Rapp et al. do not disclose injection of spermatogonial cells because the specification of Rapp et al. discuss "sperm mediated" delivery of transgenes. The applicant specifically argues "in the art 'sperm-mediated' is understood to be only spermatozoa mediated methods" (Remarks, page 9, lines 6-7). Contrary to the suggestion of the applicant, Rapp et al. define "sperm-mediated" to encompass a larger definition, including spermatogonial cells. Rapp et al. teach an "in vitro, method of incorporating heterologous genetic material into the genome of an avian involves isolating male germ cells ex corpora, delivering a polynucleotide thereto and then returning the transfected cells to the testes of a recipient male bird." (page 15, parag.0152). Rapp et al. teach "[t]he term 'male germ cells' as used herein refers to spermatozoa (i.e., male gametes) and developmental precursors thereof....which can be genetically modified, including the primitive spermatogonial stem cells" (parag.0063). Accordingly, the examiner finds the applicant's argument unpersuasive.

The examiner includes the rejection from the previous action below:

Claims 1-7 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (US2002/0076797, published 20 June 2002) in view of Rapp et al.

(US2003/0126629, published 3 July 2003) and further in view of Li et al. (2002 Poultry Science; 81:1360-1364).

Claim 1 is directed to a method for producing an avian chimera using spermatogonial cells, which comprises the steps of: (a) retrieving a testis from a donor ave; (b) isolating a testicular cell population from said testis; (c) culturing said testicular cell population in a medium supplemented with a cell growth factor to obtain a spermatogonial cell population and (d) injecting said cultured spermatogonial cell population of said testicular cell population into a testis of a recipient ave to produce said avian chimera. Lin teaches "production of chimeric animals, including transgenic chimeric animals…particularly chimeric or transgenic chimeric avians" (page 13, parag.0128). Lin teaches genes "from warm blooded vertebrates re-introduced into isolated spermatogonial cells or other relevant cells. The re-injection of the transgene-carrying cells into the testis or other relevant tissues…." (page 21, parag.0209). The instant specification teaches, "[t]he term 'testicular cell' used herein refers to a population of cells present in the testicular tissue, including spermatogonial stem cells, spermatogonial cells….This term is used interchangeably with the term 'testicular cell population'" (Spec., page 8, lines 10-16). Lin teaches, culture of primitive cells (page 12, parag.0115) in culture media or via a feeder matrix (page 12, col.0119) and further describe "a feeder matrix can be derived from or provided by the organ or tissue in which the primitive cells are located, e.g., the gonad" (page 13, parag.0120). The method of Lin also comprises "collecting primitive cells" (page 12, parag.0119). The examiner interprets the teachings of Lin to mean that primitive cells (e.g., germline stem

cells) (page 12, parag.0115) were collected from testis and cultured in medium supplemented with growth factors (page 2, parags.0011-0012). While it is clear that Lin teaches the general method of claim 1, the particular limitation of "retrieving a testis from a donor ave" is not explicitly taught. However, the examiner believes this limitation to be inherent in the teachings of Lin as described above; in order to collect the primitive cells from the gonad of an ave, Lin would have followed the standard art recognized procedures of retrieving the testis.

Lin et al. does not particularly teach the limitations wherein the donor cells are injected into the most upper portion of the seminiferous tubule of the recipient ave.

Rapp et al. teach an "in vitro, method of incorporating heterologous genetic material into the genome of an avian involves isolating male germ cells ex corpora, delivering a polynucleotide thereto and then returning the transfected cells to the testes of a recipient male bird." (page 15, parag.0152). Rapp et al. teach "[t]he term 'male germ cells' as used herein refers to spermatozoa (i.e., male gametes) and developmental precursors thereof….which can be genetically modified, including the primitive spermatogonial stem cells" (parag.0063). Rapp et al. teach an *in vivo* embodiment which "employs injection of the gene delivery mixture, preferably into the seminiferous tubules, or into the pete testis, and most preferably into the vas efferens or vasa efferentia" (page 15, parag.0154) which encompasses the most upper portion of the seminiferous tubule. Although the Rapp et al. *in vivo* and *in vitro* methods of gene delivery have some differences, it is clear that germ cells are directed into the testes in both methods. The method of Rapp et al. referred to as "in vivo" specifically recites

injection to seminiferous tubules. It is known in the art that the seminiferous tubules are located in the testes. Rapp et al. further teach that such *in vivo* gene delivery permits "genetically modified germ cell [to] differentiate in their own milieu" (page 15, parag.0154). The multistage process of sperm formation takes place in the lining of the seminiferous tubules, starting with spermatogonia or primitive sperm cells. Rapp et al. specifically indicates that modified germ cells can be transferred to the gonad of an avian and particularly indicate that "the basic rigid architecture of the gonad should not be destroyed, nor significantly damaged. Disruption of tubules may lead to impaired transport of testicular sperm and result in infertility. Sertoli cells should not be irreversibly damaged, as they provide a base for development of the germ cells during maturation, and for preventing the host immune defense system from destroying grafted foreign spermatogonia" (parag.0163). Since Rapp et al. is very explicit about not damaging the testes and also provides a method for introducing materials into the testes (i.e., injection into seminiferous tubules), the examiner believes a skilled artisan would use the method of injection into seminiferous tubules described in the in vivo method of Rapp et al. when injecting the *in vitro* transduced spermatogonia into testes.

Claim 3 is directed to the method of claim 1, wherein said cell growth factor is selected from the group consisting of fibroblast growth factor, insulin-like growth factor-1, stem cell factor and combination thereof. Lin teaches "media used in carrying out the present invention may be any suitable media….The media can be supplemented with growth factors, including…insulin-like growth factor (IGF), fibroblast growth factor (FGF)…stem cell factor" (page 13, parag.0125).

Claims 4-5 are directed to the method of claim 1, wherein said medium further comprises a differentiation inhibitory factor (claim 4), particularly leukemia inhibitory factor (claim 5). Lin teaches "The media can be supplemented with growth factors, including…leukemia inhibitory factor (LIF)" (page 13, parag.0125).

Claim 6 is directed to the method of claim 1 wherein said medium contains a supplement comprising a mixture of fibroblast growth factor, insulin-like growth factor-1, and leukemia inhibitory factor. Lin teaches "The media can be supplemented with growth factors, including… leukemia inhibitory factor (LIF), insulin-like growth factor (IGF), fibroblast growth factor (FGF)" (page 13, parag.0125).

Claim 10 is directed to the method of claim 1, wherein said ave is selected from the group consisting of a chicken, a quail, a turkey, a duck, a goose, a pheasant or a pigeon. Lin teaches the avian species considered in his methods are: chicken, quail, turkey, duck, goose, and pheasant. (page 14, parag.0135).

Claim 12 is directed to the method of claim 1, wherein said method further after the step (d) comprises the step of conducting a testcross to verify whether said recipient injected with said cultured spermatogonial cell population is chimera. Lin teaches backcrossing, intercrossing, test and control crossing to determine chimerism.

Claim 13 is directed to an avian chimera characterized in that it maintains spermatogonial cells of a donor in its testis, it has the ability to produce spermatozoa from said spermatogonial cells and said spermatozoa undergo a germline transmission into progenies. Lin teaches chimera that have spermatozoa which permit germline transmission to progeny.

Claim 14 is directed to an avian chimera according to claim 13, wherein said avian chimera is produced by any one of the methods of claims 1 to 11. Lin et al. teaches all the limitations of claim 1, thereby producing a chimeric ave.

Claim 15 is directed to a method for producing a transgenic ave, which comprises the steps of: (a) retrieving a testis from a donor ave; (b) isolating a testicular cell population from said testis; (c) culturing said testicular cell population in a medium supplemented with a cell growth factor to obtain a spermatogonial cell population; (c') transferring a foreign gene into said cultured spermatogonial cell population or testicular cell population; (d) injecting said cultured spermatogonial cell population or testicular cell population into a testis of a recipient ave; and (e) producing a progeny from said recipient to obtain said transgenic ave. Lin teaches "production of chimeric animals, including transgenic chimeric animals…particularly chimeric or transgenic chimeric avians" (page 13, parag.0128). Lin teaches genes "from warm blooded vertebrates re-introduced into isolated spermatogonial cells or other relevant cells. The re-injection of the transgene-carrying cells into the testis or other relevant tissues…." (page 21, parag.0209). The instant specification teaches, "[t]he term 'testicular cell' used herein refers to a population of cells present in the testicular tissue, including spermatogonial stem cells, spermatogonial cells….This term is used interchangeably with the term 'testicular cell population'" (Spec., page 8, lines 10-16). Lin teaches, culture of primitive cells (page 12, parag.0115) in culture media or via a feeder matrix (page 12, col.0119) and further describe "a feeder matrix can be derived from or provided by the organ or tissue in which the primitive cells are located, E.g., the gonad" (page 13, parag.0120).

The method of Lin also comprises "collecting primitive cells" (page 12, parag.0119). The examiner interprets the teachings of Lin to mean that primitive cells (e.g., germline stem cells) (page 12, parag.0115) were collected from testis and cultured in medium supplemented with growth factors (page 2, parags.0011-0012). While it is clear that Lin teaches the general method of claim 1, the particular limitation of "retrieving a testis from a donor ave" is not explicitly taught. However, the examiner believes this limitation to be inherent in the teachings of Lin as described above; in order to collect the primitive cells from the gonad of an ave, Lin would have followed the standard art recognized procedures of retrieving the testis. The result of practicing the method of Lin is a transgenic chimeric ave.

Lin does not explicitly teach the limitations of claims 2, 7 and 11.

The remaining claims are directed to further limitations of the method of claim 1, wherein the testis is digested with collagenase, trypsin or a mixture thereof (claim 2), and wherein said medium further comprises a serum and an antioxidant (claim 7). In addition, claim 11 is directed to the method of claim 1, wherein said donor and said recipient are different species.

Rapp et al. teach an "in vitro, method of incorporating heterologous genetic material into the genome of an avian involves isolating male germ cells ex corpora, delivering a polynucleotide thereto and then returning the transfected cells to the testes of a recipient male bird." (page 15, parag.0152). Rapp et al. teach an embodiment which "employs injection of the gene delivery mixture, preferably into the seminiferous tubules, or into the pete testis, and most preferably into the vas efferens or vasa

efferentia" (page 15, parag.0154) which encompasses the most upper portion of the seminiferous tubule. Rapp et al. also teach, "When the male germ cells are obtained from the donor vertebrate by transection of the testes, the cells can be incubated in an enzyme mixture known for gently breaking up the tissue matrix and releasing undamaged cells such as, for example, pancreatic trypsin, collagenase type I" (page 15, parag.0156). In addition Rapp et al. teach culture of these dispersed cells in DMEM medium with bovine serum albumin, as is standard tissue culture practice.

While Rapp et al. essentially teaches methods of transgenesis which use male germ line cells to deliver exogeneous nucleic acids, the methods share many similar teachings in common with Lin.

Therefore, it would have been obvious to the person of ordinary skill in the art at the time the invention was made to modify the teachings of Lin with those of Rapp et al. to generate a method of producing transgenic chimeric fowl in which cultured male germ cells use standard tissue culture conditions and reagents, and in which methods of injecting the transformed male germ cells into the testes are injected into the seminiferous tubule of the recipient bird. In addition, Rapp et al. teach detailed methods of isolating testicular cell populations which use collagenase and trypsin to digest an isolated testis.

Regarding the rationale for combining prior art elements according to known methods to yield predictable results, all of the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have

yielded predictable results to one of ordinary skill in the art at the time of the invention. Each of the elements (method for producing an avian chimera using spermatogonial cells; injection of spermatogonial cells into the seminiferous tubule; methods of tissue culture for of spermatogonial stem cell) are taught by Lin or Rapp et al. and further they are taught in various combinations and are shown to be used in methods of creating transgenic chimeric ave. It would be therefore predictably obvious to use a combination of these three elements in a method for producing an avian chimera using spermatogonial cells. The methods of tissue culture which use anti-oxidants (claim 7) such as β-mercaptoethanol are further known in the art and are predictable; therefore they are likewise obvious.

Regarding the limitations of claim 11, directed to a method for creating chimeric avians comprising different species (e.g., chicken-duck, chicken-quail, etc.), the teachings of Lin are quite broad and encompass such possibilities: "The term 'heterologous DNA' refers to DNA which has been transferred from one individual animal, species or breed to a different individual animal, species or breed. The term 'transgenic' refers to cells, tissues, embryos, fetuses or animals which carry one or more transgenes. The term 'chimeric' refers to an embryo, fetus or animal which consists of two or more tissues of different genetic composition." (page 14, parag.0131). Given the breadth of the definitions of Lin, the examiner believes they encompass chimeric avians comprising different species, even though there is no specific embodiment of such an animal in Lin. Rapp et al. also do not specifically teach chimeric avians comprising different species, but do refer to animals made with xenogeneic DNA.

The examiner notes that chimeric avians comprising different species have been produced in the art by other means (see Li et al.). Li et al. teach "production of duck-chicken chimeras by transferring blastoderm cells" of ducks into chicken embryos (page 1360). Therefore, the examiner asserts that given the state of the art and the breadth of teachings by Lin and Rapp et al., chimeric avians comprising different species is an obvious variant of the methods of Lin in view of Rapp et al.

Therefore the method as taught by Lin in view of Rapp et al. and further in view of Li et al. would have been *prima facie* obvious over the method of the instant application.

Accordingly, the examiner hereby maintains the rejection of claims 1-7 and 10-15 under 35 U.S.C. 103(a) as being unpatentable over Lin (US2002/0076797, published 20 June 2002) in view of Rapp et al. (US2003/0126629, published 3 July 2003) and further in view of Li et al. (2002 Poultry Science; 81:1360-1364) for the reasons of record and the comments above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

No claims are allowed.

Examiner Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Scott Long** whose telephone number is **571-272-9048**. The examiner can normally be reached on Monday - Friday, 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Joseph Woitach** can be reached on **571-272-0739**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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